

PROSPECTUS,
OR
Primordial Astronomical Instruction.
A T L A S
OF
TIME AND CELESTIAL MOTIONS,
IN A
NEW SYSTEM OF THE WORLD,

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Almanac of past Time and that to come ; to demonstrate that all the Celestial Motions are equal in Mean Time, with the only sure and new Astronomical Method of *finding the Longitude by the Passage of the Moon through the first unknown Terrestrial Meridian*, as a preparatory Step to make Tables of the Moon's Motion in her Passage.

(*To be Dedicated to the British Nation.*)

1. **T**HIS new system of the world produces a new astronomy. It places the comets (when they exist) in the center, where Copernicus placed the sun : round this center the earth, accompanied by the moon as her satellite, moves in a perfect circle, the radius of which is about three millions of leagues ; and the radius of the moon's orbit, or her distance from the earth's center is eighty, or one hundred thousand leagues, or a thirtieth part of the radius of the earth's orbit.

2. The sun moves in a concentric circle to that of the earth at thirty or thirty-three millions of leagues from the center of the world, round which Venus and Mercury revolve as satellites: beyond the orbit of the sun, Mars, Jupiter and Saturn, Georgian and the others, if there are any to the stars, with their satellites move in similar concentric circles.

3. From this new disposition, the earth being excentric, it will give the appearance to the other planets of moving in elliptical orbits, while in reality they do not. This alone destroys the elliptical motion attributed by Newton to the heavenly bodies.

4. The same excentricity of the earth makes an entire supplement to the epicycles of the Ptolemaic system, for the appearance of the earth approaching to, or receding from the other planets.

5. It also produces the effect of the periodical returns of true time to mean time, the cause to which this phenomenon is attributed by all the astronomers being false.

6. From this simple disposition of the universe, all the astronomical phenomena, which other systems cannot satisfactorily demonstrate are accounted for. It renders all the motions of all the heavenly bodies equal in time, *because there is no reason why it should be unequal or irregular.* There is in my new system a greater conveniency than in that of Copernicus. The earth performs in it a smaller orbit, the radius of which being no more than of three millions of leagues, the acceleration of the earth is only of about sixty-six thousand leagues for one degree, one-third per day: but in Copernicus's system it ought to be of nine hundred thousand leagues for fifty-nine minutes per day; the radius of her orbit being of thirty-three millions of leagues.

7. On the principles of this new system I have proceeded to the correction of time, first in the cycle, where there is no residue of time, the motions of the earth, sun and moon being commensurate to one another, which restores the splendor the cycle had in former days: second, (as a consequence of this correction) in the quantity of the solar year, and moon's synodic month: the third, in laying down that there is in the circumference of the earth a first meridian, in which the motions of the earth herself, the sun and moon agree exactly at the end of each cycle, without which the cycle would not be perfect.

8. In order to demonstrate this perfection by a fact, I propose to publish this Atlas of time and motions, and to proceed after to calculate those motions for days, hours, minutes and seconds, by means of a greater and grander projection of the same circles, and the same division.

9. In the division of this Atlas, it is impossible that the second minutes should be apparent, on account of the smallness of the circles, in order to conclude, or calculate the terrestrial longitude, and it is absolutely necessary; the difference in time of eight seconds being the difference of one degree in longitude in their passage through the moon's center.

10. This Atlas is also necessary to be joined to the tables, to be made by discrete quantity or numbers, to see how they agree with the continual quantities of daily motion.

11. I suppose that there is no calculation from numbers to determine the continual actual motion of the earth, sun, and moon, without the projection of their orbits in the plans, which must be on a scale sufficiently large to express seconds of time and space.

12. By copying this Atlas on a scale of sufficient extent, tables of the moon's motion may be constructed; this scale may be so large that seconds may be distinctly marked, and if possible the third or fourth part of a second. Then the diameter of the terrestrial orbit coming from the sun, would subtend an arc of seven degrees and a half. This will cause the sun's noon to be advanced or retarded to one terrestrial meridian, on account of the equal motion of the earth round her center, by fifteen
minutes

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minutes of mean time; but not the inclination of the ecliptic to the equator.

13. By the proposed projection of this Atlas it will be found that no other error can enter in the calculation, than that of the manual division, which will be local, and without any influence in the continuity of the motions, as are all the errors of numbers.

14. The second necessary thing to be attended to in the division of these orbits, is to make them correspond with the equal motions of the sun, the moon and the earth in the heavens. The sun must have set off at first from some point in his ecclyptic; this point is that, where by supposition, the first cycle of time took its beginning, and drawing a perpendicular from this point to the center of the world, there is in that line, or in its plane, that the center of the earth and moon being in conjunction with the sun, have met at the same moment, to be no more so in that plan, but after a whole cycle, or nineteen years, to begin another cycle. The earth, to which all the observations must be related, having in her circumference three hundred and sixty degrees, had presented to the sun in the beginning of a cycle but one point, to be noon in the same moment which is the very first terrestrial meridian.

15. I suppose now that the earth and sun are standing still in their orbits in the said perpendicular line, or plane, only that the earth moves round the center, and the moon round the center of the earth: then it is evident that the days or the terrestrial rotation would be equal, both terminate and begin in the same perpendicular line, and the moon would always finish her revolutions in it.

16. In the same manner, supposing the sun, the moon and the earth to move in their proper orbits, each will finish their revolutions as if resting in that perpendicular, or in a line or plane parallel thereto. Behold the whole secret of nature from whence all the equalities and apparent inequalities of time and motions arise: for these three bodies being in motion, change their appearance in a singular manner. This being laid down,

17. We must preserve to the earth and moon chiefly their parallelism, in all the motions they have in their proper orbits. Consequently the earth, which turns round her axis, has a meridian alone, which arrives always to the parallelism of the perpendicular of the cycles, as the pendulum clocks demonstrate it in an equal number of beats, or oscillations, or seconds: this is what is called *mean time* always invariable, because the same fixed star returns to the same meridian in an equal space of time and motion. The motion of the moon is absolutely similar to this, and the same in an equal time on account of the same parallelism, though she may go to the right or to the left of the sun, following the earth's center.

18. The most necessary things to the understanding of this construction are, the discrete quantities to be adapted to the continual quantities of those circles, which are as follow: the sun makes his revolution from the perpendicular of the cycles,

that is to say, three hundred and sixty degrees, in three hundred and sixty-five days, five hours, forty-one minutes and one nineteenth of mean time, which being repeated nineteen times, produces a whole cycle, or six thousand nine hundred and thirty-nine days and a half. It is the same as to say six thousand nine hundred and thirty-nine earth's revolutions on her axis and a half, according to the parallelism of its meridian's plane in twenty-four hours: it is the whole mean time in which all the periods and phenomena respecting the earth, the sun and moon are terminated, in order to begin again in another cycle. The earth also, setting out at the same time from the perpendicular of the cycles in her proper orbit, makes exactly twenty six turns in the space of a cycle, or nine thousand three hundred and sixty degrees, which being divided by nineteen years, give a year, four hundred and ninety two degrees and twelve nineteenths; to one day one degree twenty minutes and a fraction. In this manner the earth shall finish each year of a cycle in a different point of her orbit, according to her parallelism, so that she terminates the last year of a cycle in her perpendicular, in order to begin another.

18. The moon in her orbit round the center of the earth begins her motion at the same time as the earth and sun, from the same perpendicular of the cycles. The duration of her orbit, according to the said parallelism, is of twenty-seven days, seven hours, forty-two minutes and twelve-two hundred and fifty-fourths; she makes thirteen turns in a year, and moves about ten days of a fourteenth, so that the moon makes in nineteen solar years two hundred and fifty-four turns exactly round the center of the earth, or ninety-one thousand four hundred and forty degrees, in six thousand nine hundred and thirty-nine turns and a half, of the earth round her center. The moon's center, in the end of its turns round the earth, makes a perfect parallelism with the center of the earth to the perpendicular of the cycles, as the plane of the first terrestrial meridian makes it every twenty-four hours. Consequently the moon runs per day, as a mean motion, thirteen degrees, ten minutes and eight thousand three hundred and ninety-thirteen thousand eight hundred and seventy-ninths. I say *mean motion*, because the moon being an earth's satellite, the spaces run in the interior part of the earth's orbit are naturally shorter than the spaces run over in the exterior part of it, which causes the apparent inequality of her motion, as I shall demonstrate to my subscribers; and that this is also a demonstration of the impossibility of Copernicus's system to exist.

19. From this motion of the moon it results, that she performs in one year twelve lunations, or twelve synodic months, which relate only to the illumination of her disk by the sun, called the lunar year, of about three hundred and fifty-four days. In the next following eleven days wanted to complete the solar year, the moon begins the thirteenth lunation, after the thirteenth conjunction in the same solar year, which space of time is named

Epact. This epact of eleven days in the space of nineteen years

of

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of a cycle, forms about seven synodic months, which joined to two hundred and twenty-eight others, produced from the multiplication of twelve synodic months by nineteen years, make two hundred and thirty five lunations exactly. The epact and the synodic months are as an accidental result of the sun's illumination; consequently they will be unequal one to another, the epact of one year unequal to the epact of another, on account of the terrestrial orbit's semidiameter. This, notwithstanding, serves to demonstrate, in the nineteen years of a cycle, the wonderful equality of motions in the earth, the sun and moon, as I prove it in my correction of time. The synodic month and the epact will be considered as a result of her proper motion in her orbit, as it is said in the precedent No. 18, by the observation of which nevertheless the ancients have observed her motion and reckoned her duration.

20. Thus the division of all those quantities corresponding perfectly one with the other is very mechanical, and to be made by the art of division, the demonstration of which is the intent of this Atlas, from whence all the inequalities of time and motions will be as a result of the same equality and the same uniformity. All, I say, is but an appearance or an effect necessarily rising from this new position of the earth, the moon and the sun. We can place in this number the periods of true time, the synodic month, the epact, and other quantities.

21. The first of the said effects is the most remarkable of all, when one can observe that the true time, that is to say the sun's noon, and consequently arising and setting, advances or retards the noon of mean time by more than fifteen minutes, without augmenting the duration of the day. It can be explained in another manner, if we conceive that the earth, by turning always in an equal time, in order to present the same meridian to the same point in the heavens as is a fixed star, meets the center of the sun by the same meridian fifteen minutes sooner or later than it ought to be as for the star. Hence it is evident, that then the sun's center deviated from this regular point, where the regular motion of the earth ought to meet it; for the earth in the same time cannot be regular and irregular in her rotation, as it is evident by the pendulum clocks and the noon of the sun. The astronomers have ascribed this effect to the inclination of the ecliptic to the equator. But as the inclination of the ecliptic to the equator is the same thing as the inclination of the equator to the ecliptic, all those inclinations are but empty words, which cannot produce in the heavens, and in the rotation of the earth (remaining always in the same position) any change in the motion, neither in time, relatively to the same meridian and to the same point in the heavens. In respect to the earth, the reason of this impossibility is, that the earth produces on account of the other meridians relatively to the other points in the heavens, the same effect as the first meridian to one point in the heavens, the inclination of the earth being always the same. In order to the sun, his rays are always existing without any change, setting out from his center, which is one point

point in the heavens. Its delination is not a reason of the difference of true time to mean time; for the tables in the Almanac, 1774, the 19th of March, in which the declination and the longitude is 00, the difference of true time to mean time is seven minutes, fifty seconds, and nine thirds, which turned in space makes almost two degrees of deviation from his regular place, according to the rotation of the earth. In my new system this difference gives the diameter of the terrestrial orbit, the radius of which is three millions of leagues more or less, which is a wonderful difference.

22. By the publication of this Atlas, a new mechanical astronomy will be found, the certainty of which in its results, will consist only in the exactness of the division, which principles being the most simple as demonstrated, is the reason why this new method, wheteby I propose to find the longitude, is also mechanical, and subject to the most exact or minute division, as well as the tables which arise from the fixed spaces are daily run over by the moon, the sun and the earth, in two cycles. The spaces run daily by the moon in such an undiscontinuous space of nineteen years being exact, present the means of dividing it in twenty four hours, minutes, and seconds, while the rotation of the earth also, in twenty-four hours, from the sun's center to the same center, measures it as a nonius, and the point in which those two motions agree with, is exactly that of the passing of the moon through the first meridian of the earth.

23. I say, that the first meridian on earth in which time and motion take their beginning in each cycle is quite unknown.—Notwithstanding, the tables of discrete quantity ought to be made for it, in supposing one fixed meridian in the circumference of the earth, which begins and finishes one cycle. The said tables being made for the passage of the moon through this first meridian, I observe the same passage in any other equally unknown meridian, as that of London, of Rome, or Mexico.—I find this passage, as for example, in London, to day, at thirteen hours, twenty minutes, twelve seconds. I seek in the tables, and I find that on the same day the passage through the first meridian was at thirteen hours, eighteen minutes, and four seconds: then this passage is sooner by two minutes and eight seconds, or one hundred and twenty-eight seconds. I see also that this day, the total of retardation of the moon's passage for the same meridian, is of forty eight minutes, whence I conclude, that eight seconds are for this day the retardation of one degree; then, in dividing one hundred and twenty-eight seconds to eight seconds of one degree, sixteen degrees come for the difference in longitude from London to the first terrestrial meridian, which now will be no longer unknown, but at sixteen degrees eastward of London. This example demonstrates how many less difficulties are in this method than in any other. This example is also to be followed always in the practice, by the repetition of which it will be found that the longitude of every place will be fixed very astronomically.

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24. In short, this atlas ought to serve for the demonstration of the manner in which the tables will be made: when the terrestrial orbit shall be made with four thousand feet in diameter, more or less, and the moon's orbit being in proportion, in a moveable circle, the centre of which will be the earth, to be divided as the second minutes may be clearly marked; the moon's orbit, with all her divisions following the earth in her orbit, conserves always her parallelism to the perpendicular of the cycles, and in the same time the daily motion of the moon may be marked in an inferior plane, which shall give in a spiral line the spaces run over by the moon in twenty-four hours of mean time, as much as nineteen years of a cycle, with no interruption of this daily motion. Now it is evident, that the daily motion of the moon describes, and represents by the spaces the twenty-four hours of mean time, as well as the whole heavenly circumference represents the twenty-four hours of true time, from the centre of the sun to the same centre in the next day, which is measured daily by the first terrestrial meridian:—then it is evident that those two twenty-four hours, that of the true time described by the first meridian, and that of the moon, in mean time in their daily motion, both agree in one point which is the passage of the first terrestrial meridian through the moon's centre, which depends entirely from the proper motion of the sun, the earth, and moon in their proper orbits in mean time. In this position true time has nothing in common with it, and the meeting of this passage varies at the rate of their variation. By these means one cannot be mistaken in announcing it for thirty-eight years, if the projection of those circles and motions is well proportioned and divided in mean time. All the irregularities ascribed by the astronomers to the moon's motion arise rather from the combination of motions proper to those three bodies, which in this method cannot have another mistake than that of the division.

25. This atlas, made for the representation of it, will contain 1^{mo}, This primordial instruction. 2^{do}, The correction of time applicable to all the systems. 3^{to}, The address to the Board of Longitude. 4^{to}, My Petition to the Parliament of Great Britain for the purpose of preserving my right and property. 5^{to}, A true method for demonstrating the error and the falseness of all astronomical tables, chiefly those of the moon, with other things of this kind. 6^{to}, It will contain thirty-eight copper-plates—representing the motion of the sun, the moon, and earth, day by day, in thirty-eight years of two cycles. Another plate will be added, containing the general motion of one cycle to demonstrate the exactness of a new astronomy. It is impossible to conclude any thing perfectly from the smallness of this book, though it will be the greatest possible on the largest atlas paper; but it will be published for the demonstration of the principles in this new system. A chronological compendium will be made, to demonstrate that the beginning of the Christian æra is placed at the end of 210 cycles of the world, or in 3990, as it is proved
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by the astronomical calculation in the correction of time, which perfectly agree with the computation of the Holy Bible.

At the end of this atlas two other productions of the author will be added, viz. his discoveries in hydraulics, and on weights and measures. Upon the measures he has the pleasure of offering a certain method for measuring the length of the pendulum, which is always equal in all the climates of the earth, against the assertion of the academy of Paris.

CONDITIONS OF THE SUBSCRIPTION.

This atlas will be printed on the greatest atlas paper, and in three languages—Latin, English, and French, for the convenience of all nations.

Those who desire to have a greater account and knowledge on the certainty of the moon's motion before their subscription, may call at No. 74, Hay-market, where the author will shew to the subscribers a specimen of a whole year of moon's motion in his new system.

As the Atlas paper, the printing, and the exact division so carefully treated will render this work very expensive, the subscribers will pay three guineas and a half in subscription, and two and a half at the delivery of the work—to nonsubscribers nine guineas.

The subscriptions will be received at the following Booksellers: Mr. Edwards, Pall Mall; Mr. Booby, Broad-street, Royal Exchange; Mr. Chapman, No. 151, Fleet-street; Mr. Debret, Piccadilly; Mr. Boffe, Gerrard-street; and others.

I am very happy in announcing to the public, that all former objections of finding the longitude by the passage of the moon over any terrestrial meridian, on account of the impossibility of observing her transit to any degree of sufficient accuracy by any nautical instrument hitherto used, is now happily removed, as P. R. Nugent, Esq. (Gray's Inn Coffee house), has invented an universal reflecting septant, which amongst many other useful and ingenious matters, resolves all necessary nautical astronomy, by immediate observation, and by which the transit through the meridian may be easily and accurately taken at sea or on shore, by the most simple observer. This being the only necessary operation for my new method of finding the longitude, I am persuaded that by this instrument, after my new tables will be made, the longitude will be found without any error of observation. He hath also invented an universal azimuth, or steering compass, by which and the aforesaid instrument, the magnetic variation may be obtained to degrees, minutes, and seconds;—and the entire simplicity of these instruments are such, that the public of all countries may henceforth be supplied, for half the present cost of such inadequate instruments.

